VOLUME-3, ISSUE-8

FUNCTIONAL FEATURES OF MATERIAL SCIENCE TERMINOLOGY IN ENGLISH AND UZBEK LANGUAGES

Yavminova Nafisa Mashrobjonovna
Namangan state technical university
"Foreign languages" department

ABSTRACT

This article explores the functional features of terminology in the field of material science in both English and Uzbek languages. Material science terminology serves not only as a linguistic tool but also as a means of knowledge transfer in academic, industrial, and research contexts. The study highlights semantic, structural, and functional aspects of terms, emphasizing the challenges of translation, adaptation, and standardization in a bilingual environment.
Keywords: Material science, terminology, functional features, linguistic tool, transfer.

1. Introduction

Material science is a multidisciplinary field involving the study of metals, polymers, ceramics, composites, and nanomaterials. Accurate and precise terminology is critical for effective communication among scientists, engineers, and students. In bilingual contexts, such as in Uzbekistan, terminology functions as a bridge between English-language academic literature and Uzbek technical practice.

The aim of this study is to investigate the functional features of material science terminology in English and Uzbek, focusing on how terms convey meaning, structure, and usability in educational, research, and industrial contexts.

2. Literature Review

Numerous scholars have examined the development and functional aspects of scientific terminology. For instance, Crystal (2008) emphasizes the role of terminology in knowledge dissemination, while Mel'čuk (2006) focuses on structural-semantic properties of technical terms. In the Uzbek context, studies by Normurodov (2014) and Yusupova (2019) analyze the adaptation of English material science terms in Uzbek textbooks and technical manuals.

Key functional aspects highlighted in literature include:

1. Denotative Function – ensuring each term corresponds to a specific material or process.
2. Cognitive Function – facilitating comprehension and memory in educational contexts.
3. Communicative Function – enabling precise communication between experts.
4. Pragmatic Function – supporting practical application in industrial or laboratory settings.

These studies provide a theoretical basis for analyzing bilingual material science terminology.

3. Methodology

This study employs a descriptive-analytical approach. A corpus of 150 material science terms in English and Uzbek was compiled from textbooks, research articles, and industrial manuals.

Steps included:

1. Term Selection – terms related to metals, ceramics, polymers, composites, and nanomaterials were selected.
2. Translation Analysis – English terms were compared with their Uzbek equivalents to identify semantic equivalence, calques, and loanwords.

3. Functional Analysis – terms were analyzed according to denotative, cognitive, communicative, and pragmatic functions.

4. Structural Analysis – morphological and syntactic structures were examined to understand adaptability between languages.

4. Results and Discussion

4.1 Semantic Features

• Most English material science terms are monosemantic (e.g., polymer, ceramic), but some exhibit polysemy (alloy may refer to mixture or metaphorically to combination).

• Uzbek equivalents often involve calques or borrowed forms (e.g., polimer from polymer, keramika from ceramic).

4.2 Structural Features

• English terms often use compound nouns (cubic boron nitride, glass-ceramic).

• Uzbek terminology adapts via suffixes and affixation (kubik boron nitridi, shishakeramika).

4.3 Functional Features

• Denotative: Each term clearly identifies a material or process, minimizing ambiguity.

• Cognitive: Terms in both languages support memorization through morphological transparency (polikaproamid clearly derives from caprolactam).

• Communicative: Bilingual professionals can exchange knowledge effectively using shared terminology.

• Pragmatic: Terms guide practical work in laboratories, industrial production, and research.

4.4 Challenges in Translation

• Some English terms have no exact Uzbek equivalents, leading to loanwords or descriptive translations.

• Technical accuracy must be balanced with understandability for students and engineers.

5. Conclusion

Material science terminology in English and Uzbek exhibits distinct functional features that ensure clarity, precision, and usability in academic, research, and industrial contexts. While English terms often maintain compact, compound structures, Uzbek equivalents may involve descriptive translations or calques. Understanding these functional features is essential for effective bilingual communication, terminology standardization, and the development of educational materials.

Future research should focus on creating standardized bilingual glossaries, exploring terminology evolution in emerging fields such as nanotechnology, and developing digital tools for automated translation and semantic verification.

REFERENCES

1. Crystal, D. (2008). A Dictionary of Linguistics and Phonetics. Wiley-Blackwell.
2. Mel'čuk, I. (2006). Towards a Science of Terminology. John Benjamins Publishing.
3. Normurodov, A. (2014). English-Uzbek Material Science Terminology. Tashkent University Press.
4. Yusupova, N. (2019). Bilingual Terminology in Engineering Education in Uzbekistan. Journal of Technical Education, 3(2), 45-58.
5. Zeng, M., & Wang, L. (2017). Functional Linguistics in Scientific Terminology. Science Language Studies, 12(1), 22-36.
6. N.M. Yavminova "Structural analysis of materials science terms in Uzbek and English languages" American Journal of Advanced Scientific research. ISSN 2195- 1381 Volume- 5 June 2025 http://ijarer.org/index.php/ij/index#